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Published:

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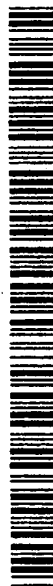
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(54) Title: FLUOROCARBON REFRIGERANT COMPOSITIONS

(57) Abstract: The invention provides fluorocarbon refrigerant compositions that offer alternatives, and are considered environmentally safe substitutes, for CFC's and HCFC's. The compositions of the invention are useful as refrigerants, including for use in chillers, aerosol propellants, metered dose inhalers, heat transfer media, gaseous dielectrics, fire extinguishing agents, foam blowing agents, solvents and sterilants. The compositions of the invention are soluble in lubricating oils and are, therefore, particularly useful as R-22 retrofit fluids.

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INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C09K5/04 C09K3/30 C08J9/14 C23G5/028

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C09K C08J C23G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 659 862 A (SANYO ELECTRIC CO) 28 June 1995 (1995-06-28) the whole document	1-3,9, 12,14-17
X	EP 0 779 352 A (AUSIMONT SPA) 18 June 1997 (1997-06-18) the whole document	1,2,10, 11, 14-17,28
X	WO 96 03473 A (MURPHY FREDERICK THOMAS ; CORR STUART (GB); ICI PLC (GB); MORRISON) 8 February 1996 (1996-02-08) the whole document	1-6,9, 12,14-17
X	US 5 688 432 A (PEARSON STEPHEN FORBES) 18 November 1997 (1997-11-18) the whole document	1,2,11, 14-17,28
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Z document member of the same patent family

Date of the actual completion of the international search

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 670 079 A (LUNGER BROOKS SHAWN ET AL) 23 September 1997 (1997-09-23) the whole document	1,2, 14-17, 20,22
X	DE 42 26 431 A (PRIVATE INST FUER LUFT UND KA) 17 February 1994 (1994-02-17) the whole document	1,2, 13-17
X	EP 0 638 623 A (AUSIMONT SPA) 15 February 1995 (1995-02-15) the whole document	1,2, 13-17
X	DATABASE WPI Section Ch, Week 199742 Derwent Publications Ltd., London, GB; Class E19, AN 1997-454151 XP002194080 & JP 09 208940 A (SANYO ELECTRIC CO LTD), 12 August 1997 (1997-08-12) abstract	1,2,9,12
X	WO 97 15637 A (HAN LIZHONG ; UNIV TSINGHUA (CN); ZHAO XIAOYU (CN); YE MAO (CN); ZH) 1 May 1997 (1997-05-01) abstract	1,2, 14-17
P,X	WO 00 56834 A (DU PONT) 28 September 2000 (2000-09-28) the whole document	1-3, 7-12, 14-17, 20,22

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Present claims 1-28 relate to an extremely large number of possible compositions of a refrigerant (i) and a solubilizing agent (ii) and processes using said compositions. Support within the meaning of Article 6 PCT and disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of the compositions and processes claimed. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely those parts relating to the compositions prepared in the examples 1,2,4-7 wherein the refrigerant (i) is a mixture of R-32, R-125 and R-134a and a reasonable generalisation thereof.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/30276

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0659862	A	28-06-1995	JP 7173460 A CN 1317533 A CN 1108290 A DE 69410966 D1 DE 69410966 T2 EP 0659862 A1 US 2001017364 A1	11-07-1995 17-10-2001 13-09-1995 16-07-1998 08-10-1998 28-06-1995 30-08-2001
EP 0779352	A	18-06-1997	IT MI952627 A1 EP 0779352 A1	16-06-1997 18-06-1997
WO 9603473	A	08-02-1996	AT 205872 T AU 698733 B2 AU 2988795 A BR 9508347 A CA 2195411 A1 DE 69522811 D1 DK 772659 T3 EP 0772659 A1 ES 2163520 T3 WO 9603473 A1 JP 10503230 T	15-10-2001 05-11-1998 22-02-1996 30-09-1997 08-02-1996 25-10-2001 26-11-2001 14-05-1997 01-02-2002 08-02-1996 24-03-1998
US 5688432	A	18-11-1997	AU 7660994 A DE 69403809 D1 DE 69403809 T2 EP 0720639 A1 JP 9503800 T	10-04-1995 17-07-1997 22-01-1998 10-07-1996 15-04-1997
US 5670079	A	23-09-1997	US 5458798 A AU 6096594 A CN 1174970 A EP 1028152 A2 EP 0682683 A1 JP 8506581 T WO 9418282 A1 US 5624596 A US 5635098 A CN 1119454 A	17-10-1995 29-08-1994 04-03-1998 16-08-2000 22-11-1995 16-07-1996 18-08-1994 29-04-1997 03-06-1997 27-03-1996
DE 4226431	A	17-02-1994	DE 4226431 A1	17-02-1994
EP 0638623	A	15-02-1995	IT MI931829 A1 AT 174374 T DE 69415099 D1 DE 69415099 T2 EP 0638623 A1	13-02-1995 15-12-1998 21-01-1999 29-04-1999 15-02-1995
JP 9208940	A	12-08-1997	NONE	
WO 9715637	A	01-05-1997	CN 1148613 A CN 1162616 A AU 7276996 A WO 9715637 A1	30-04-1997 22-10-1997 15-05-1997 01-05-1997
WO 0056834	A	28-09-2000	EP 1163313 A1 WO 0056834 A1	19-12-2001 28-09-2000